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Soil and Water Conservation News

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United States Department of Agriculture
Soil Conservation Service



Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget through January 31, 1987. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Postage paid at Washington, D.C.

Magazine inquiries
Send inquiries to: The Editor, *Soil and Water Conservation News*, Public Information Staff, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, D.C. 20013.

Subscriptions
Send subscription orders to:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Comments:

From the SCS Chief

Volunteers Save Soil and Water

President Reagan proclaimed the National Year of Voluntarism (May 1, 1983 to April 30, 1984) to recognize generous and civic-minded volunteers who are making better communities.

We join him in urging more people to volunteer their talents.

In 1983, more than 600 volunteers donated 68,000 hours to help the Soil Conservation Service put more conservation on the land. At an average value of \$8 an hour, an amount other USDA agencies are using to calculate the monetary value of volunteer work, the contribution totals more than \$500,000.

We congratulate all volunteers for acting on their concern for natural resource protection and thank them wholeheartedly for helping us to accomplish our mission.

Although the new program—under which volunteers receive legal protection as well as insurance for any work-related injuries—did not begin until May 1982, the volunteer concept is not new to SCS. We have historically worked with farmers and community leaders on a volunteer basis.

The volunteer efforts of the 15,000 conservation district supervisors, for example, have been the backbone of strong local conservation programs. Resource Conservation and Development councils as well as watershed projects involve thousands of volunteers every year. This new program is a way to expand on that cooperation.

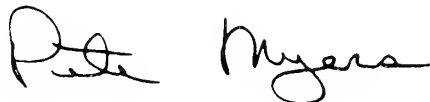
Some field people have expressed concern about finding time in their already full schedules to train volunteers. I suggest one approach: First, identify a specific job that can be done by a volunteer; second, write a brief job description; third, seek someone with the needed skills.

One way to recruit qualified volunteers is to tell groups and organizations, who share our conservation concerns, about volunteer opportunities.

Another way is through the new Touch America Project (TAP) sponsored by the Forest Service for volunteers 14 to 17 years old. TAP provides many opportunities for SCS and Extension Service volunteers to do conservation work on public lands.

Current SCS volunteers are helping farmers, ranchers, and other landowners to reduce wind and water erosion, keep streams clean, and promote good land use. They are working on the land, in schools, with organizations, and in offices.

If we can continue to build on this experience and success, the Nation has much to gain in soil and water conservation—from volunteers and SCS employees working together.



Cover: Volunteer Leslie Coyle and her daughter, Joan, plant beachgrass to protect a walkway through the Back Bay National Wildlife Refuge in Virginia Beach, Va., from blowing sand. See Chief's Comments and article beginning on page 3. (Photo, Louis Cullipher, district conservationist, SCS, Virginia Beach, Va.)

John R. Block
Secretary of Agriculture

Peter C. Myers, Chief
Soil Conservation Service

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Focus on SCS Volunteers

The following are examples of the work that Soil Conservation Service volunteers are doing across the United States. They show the diversity of people and tasks they are performing as volunteers.

SCS volunteers bring many skills and much enthusiasm to their conservation work. All leave with job training, work experience, and exposure to the latest conservation practices. But above all, they gain a deep appreciation for that fragile layer of soil that supports all life and a sense of satisfaction that they acted to protect it.

California

California's many SCS volunteers include one of the first to step forward, Christine Hirsch of Santa Cruz. Hirsch coordinates a college erosion control training course and does other SCS community education activities while holding a full-time job in a similar field.

Actor Eddie Albert lent his theatrical experience and familiar voice to the production of conservation radio announcements. The volunteer program is the latest of many social and ecological campaigns that Albert has helped to promote.

"A project just looking for someone to

do it," is how volunteer Deborah Wise speaks of the Santa Cruz County landslide survey she is conducting. SCS started the survey after 3 days of heavy rain in the winter of 1982 caused many landslides in the mountainous county. Houses, timberland, and 17 lives were wiped out when hillsides could hold no more water and gave way.

Wise had finished a degree in geology and decided to use the volunteer project to get some professional work experience helping research the causes and possible prevention of slides.

In the dry, flat part of the State, Lola Queensbury volunteers at the Blythe SCS office in Riverside County.

"I really enjoy the program," she says. "It helps expand my horizons because there's always something new and exciting happening."

Variety has typified her work. Besides reorganizing the filing system and gaining valuable clerical skills in the office, she has helped gather field data on land use and soil salinity levels.

African engineer Caleb Bhembe has returned to his native Swaziland in eastern Africa to use the skills he gained as an SCS volunteer in Fresno. During a 2-month appointment, Bhembe helped evaluate farm irrigation systems and worked on a guide for preventing salt accumulation in soil.

Florida

A retired SCS technician and army reserve officer, Johan Moen, has already logged well over 1,000 hours of volunteer work at the SCS plant materials center (PMC) in Brooksville, Fla. Robert Glennon, SCS soil conservationist at the PMC, said, "By maintaining the grounds and helping with peak workloads, Moen has enabled the staff to concentrate on its technical responsibilities."

Moen waters greenhouse and field plantings; mows terraces, field borders, and lawns; and hoes weeds. He also cleans and plants seeds, tests them for germination, pots plants, and does hand threshing.

"With a growing season that extends well into December, there is no shortage of work for our enthusiastic volunteer," said Glennon.

Iowa

In Iowa, SCS volunteers are VIPS (Volunteers in Protecting Soil), and the State has close to 90 on board. One of them is Dan Murphy, president of the Dan Murphy Company, a public relations firm in Des Moines. According to Lynn Betts, SCS public affairs specialist in Iowa, Murphy has done much to make the volunteer program a success. He wrote and designed a brochure publicizing the program, put together a widely used slide show about volunteers, and made up certificates which can be used to recognize VIPs for their hard work.

Betts also reports that Murphy, a former conservation district commissioner, volunteered his time and talents to talk to a group of SCS'ers about good public relations practices. Said Murphy, "I've been involved in volunteer work related to soil and water conservation for a long time. I believe that volunteers can do much to put conservation on the land."

A Louisa County farmer and former chief engineer for the Iowa Natural Resources Council, Wayne Geiselman, is another Iowa VIP. Geiselman is coordinating a countywide conservation education program. He said that he believes education is the first step in solving natural resource problems. One of his projects



Members of a second-grade Brownie troop in Huron, S. Dak., Myra Bombeck, left, and Christina Watkins, demonstrate using one of the 500 special ropes that their troop volunteered to make for farmers to use to measure crop residues on their fields.

includes a long-range plan for an environmental education center along the Mississippi River.

The volunteer work of high school student Paula Anderson in the SCS Fort Dodge field office includes measuring residues on fields to check if they qualify for a wind erosion control program, recording data for surveying, learning about drainage maps and soil types, and helping around the office.

Anderson learned of the SCS volunteer program when SCS District Conservationist Ken Meyer gave a presentation at the Fort Dodge High School career day. According to Anderson, her volunteer work is a vehicle for learning conservation firsthand, a method to gain some practical field and office work experience, and possibly the start of a lifetime career.

Missouri

As an SCS volunteer with the Jackson County Soil and Water Conservation District (SWCD), Bill Kuehn of Raytown, Mo., retired from the U.S. Department of Labor, is back at the job he had as a youth in the Civilian Conservation Corps (CCC) in the thirties.

According to David Ferril, a conservation education specialist with the SWCD, Kuehn joined the CCC in 1936. His

3-year hitch took him back and forth across Nebraska where, among other projects, he helped to build woven brush dams in gullies to stem further erosion. With a shovel he dug out farm machinery parked along fencerows that had been completely buried by the dust storms of the thirties. Kuehn also spent time in South Dakota building roads, cutting fire trails in the Black Hills, and fighting forest fires. One conservation practice he remembers very well, and one that the CCC was especially noted for, was planting trees for windbreaks.

SCS District Conservationist in Jackson County, Diane Reinhardt, said that as an SCS volunteer, Kuehn has been a big help to the SCS staff in assisting farmers with the design and layout of terraces and grassed waterways.

Kuehn learned firsthand the harsh conservation history lesson of the thirties, and by becoming an SCS volunteer, he hopes to do his part to keep history from repeating itself.

Montana

In the SCS Miles City field office in Montana, Barbara Gorges is volunteering her time to help soil conservation technicians make engineering surveys for land leveling and installing irrigation pipelines.

SCS District Conservationist Roger Goff said that Gorges' help takes the pressure off the regular SCS staff in busy times.

Gorges has a bachelor of science degree in natural resource management from the University of Wisconsin at Stevens Point and has taken additional range management courses. She has worked for USDA's Forest Service and the U.S. Department of Interior's Bureau of Land Management as a survey aid and range technician.

Another SCS volunteer is Christine Cavin who works in the SCS Plains field office. She assists the soil conservation technician and soil conservationist with engineering surveys by taking notes or running the rod. She collects seed for the plant materials program and drafts articles for local newspapers. Cavin has a farm background.

At the SCS Columbus field office, Stephanie Kellogg volunteers 16 to 20 hours a week collecting resource information for conservation plans, such as range site and condition surveys. She also inks in conservation plan maps. Kellogg has a bachelor of science degree in forestry from the University of Montana. She does conservation education activities with 4-H, school, and other youth groups and has worked for SCS before as an intermittent employee in the same capacity. In addition to her volunteer work, Kellogg works part time for the conservation district gathering information on saline seeps in preparation for a special effort aimed at controlling them.

Pennsylvania

SCS district conservationist for Warren and Forest Counties, Wes Ramsey, reports that Richard Foote, an SCS volunteer, has been selected to be the new conservation district manager. Foote has volunteered more than 700 hours and plans to continue his volunteer work to gain more experience in applying conservation practices.

When asked why he took a volunteer position with SCS, Foote said, "After searching the job market for work in the environmental field, I realized that my



Volunteer Bill Kuehn assists the SCS district conservationist in Jackson County, Mo., Diane Reinhardt, with the fieldwork for designing a grassed waterway.

college degree in biology was not enough. Employers all wanted experience. I saw the volunteer program with SCS as a way to gain experience that might help me pursue a career."

Of the more than 30 applicants for the part-time district manager job, about half had college degrees similar to Foote's, but his volunteer experience with SCS won him the job.

Rhode Island

An SCS volunteer with the Rhode Island Resource Conservation and Development (RC&D) office, Linda Coningford, helped a \$2 million bond referendum for purchasing development rights to the State's farmland to pass in a November 1982 election.

On behalf of the Farmland for the Future Coalition, Coningford had organized other volunteers to tell people about the importance of preserving the State's farmland. They organized meetings; displayed posters; made targeted mailings; and distributed flyers at local fairs, shopping centers, and Rhode Island's famous Johnny Cake Festival!

In September 1982, the coalition sponsored an Open Farm Day. More than 6,000 people visited eight farms to see for themselves what Rhode Island farmers were producing. The event was covered by two television stations and a local newspaper.

The \$2 million bond referendum passed by a margin of 80,000 votes. "There were 10 referendums on the ballot and the purchase of development rights of the State's farmland passed by the largest majority," said Coningford. "This shows that the efforts of volunteers really can make a difference. The more people heard about the need to preserve our farmland, the more supportive they became."

Coningford was recognized at the Rhode Island RC&D Council's annual meeting for her efforts. She also received a certificate of appreciation from SCS at its State awards program and two letters of commendation, one from the State conservationist and one from the RC&D council chairperson.

Washington

In King County, Wash., a retired educational resource specialist, Vern Maxwell; a retired engineer, George Brown; and a graduate student in landscape architecture at the University of Washington in Seattle, Catherine Meeks, have joined the ranks of SCS volunteers.

SCS District Conservationist Joseph Henry reports that he recruited Maxwell and Brown from a local group of the statewide Retired Senior Volunteer Program. Meeks was recommended to Henry by a former SCS national landscape architect, Sally Schauman, who is now a professor at the University of Washington.

Maxwell has been working about 14 hours a week distributing the new SCS publication, *Conserving Soil*, to all of the county's junior high and middle schools. "This is not a small job in the State's largest metropolitan county," said Henry. "So far, Maxwell has contacted teachers, vice principals, and curriculum directors in about 70 schools."

A teacher at Sacajawea Junior High School, Pam Sturgeon, said, "*Conserving Soil* is a comprehensive and valuable teaching aid. I plan to incorporate its use into our life sciences curriculum."

For landowners who have requested assistance, SCS volunteer Brown has been working 1 day a week making inventories of dairy farms and designing waste management systems. Brown is including methods of manure collection, storage, and field application that meet farmers' needs and provide the best water quality protection.

Meeks has been devoting about 16 hours a week to helping develop a draft plan for the Newakum Creek PL-566 small watershed project. It involves 18,000 acres and 27 miles of stream, parts of which violate State water quality standards. Meeks has also been working on a slide show of the project.

For the Green River PL-566 watershed project, Meeks has been assisting with designing landscape features that can be incorporated into flood control measures. She is also working on developing landscape features for practices such as

manure storage ponds to make them more appealing.

West Virginia

Geetha Mala Jayawickrema Harward, a senior at Philip-Barbour High School in Barbour County, W. Va., has been an SCS volunteer for the past two summers. Working about 18 hours a week out of the Philippi field office, Harward has assisted with the planning and design of diversions, waterways, ponds, and spring developments.

Asked why she became an SCS volunteer, Harward said, "I've always enjoyed outdoor work and this was an opportunity to gain some work experience." Harward said that she learned of the volunteer program from an announcement made over the public address system at school. She also said that she intends to continue in the volunteer program and tell her friends about it.

SCS District Conservationist Wayne Maresch in Philippi said, "Both the volunteer and SCS gain from this new volunteer program. Harward is gaining job experience and an opportunity to observe our agency and other agencies at work. SCS is gaining the completion of needed soil and water conservation practices."

Compiled by
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associate editor, *Soil and Water Conservation News*,
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News Briefs

Subtelemetry System Piggybacks SNOTEL

SNOTEL (snow telemetry) is adding new dimensions to its data collection ability with a subtelemetry system that increases its capabilities.

For the past 7 years, SNOTEL, the Soil Conservation Service's automated snow data collection network, has been providing data for developing water supply forecasts.

Currently sensors at 490 remote sites collect data such as snow water content, precipitation, and temperature. These data are transmitted by VHF radio signals that bounce off meteor trails to two master stations in Ogden, Utah, and Boise, Idaho. The computers at these master stations are linked by telephone to each other and to a central computer in Portland, Oreg. SCS State offices in the West are able to obtain current snow survey information through their computer terminals.

Now SCS is experimenting with a subtelemetry system to piggyback data from additional data sites through existing SNOTEL sites. These sites require only transmitters which are significantly cheaper than the radio receiver/transmitters at existing SNOTEL sites, so they offer a cost-effective way to collect more data.

In 1980, SCS tested the subtelemetry system at a SNOTEL site on a mountain above Reno, Nev. A local agency wanted to monitor the ground water level in an adjoining valley. Rather than install another SNOTEL site, SCS tried a subtelemetry system. It worked, enabling one SNOTEL site to collect data both on a mountaintop and on a valley floor.

In the fall of 1981, SCS installed a subtelemetry system on what was left of the north side of Mount Saint Helens. The less costly transmitters made it feasible to install them in this high risk area to help monitor potential hot ash flow areas.

In 1982, a subtelemetry system was installed in Utah to monitor effects of the Colorado River Basin Salinity Control Program. In 1983, a subtelemetry system was installed in Colorado for this same purpose.

Ronald Moreland, SCS assistant State conservationist in Reno, Nev., says the system still needs refinement but offers an opportunity to expand an individual SNOTEL remote site's 16-channel capability in a cost-effective way.

Mary Lou Damoth,
volunteer, SCS, Reno, Nev

Students Dial SNOTEL

By dialing a computer in Portland, Oreg., students in Colorado can instantly estimate snow depth in remote Rocky Mountain locations such as Grizzly Peak, Lizardhead, and Deadman Hill—or the Vail ski resort area.

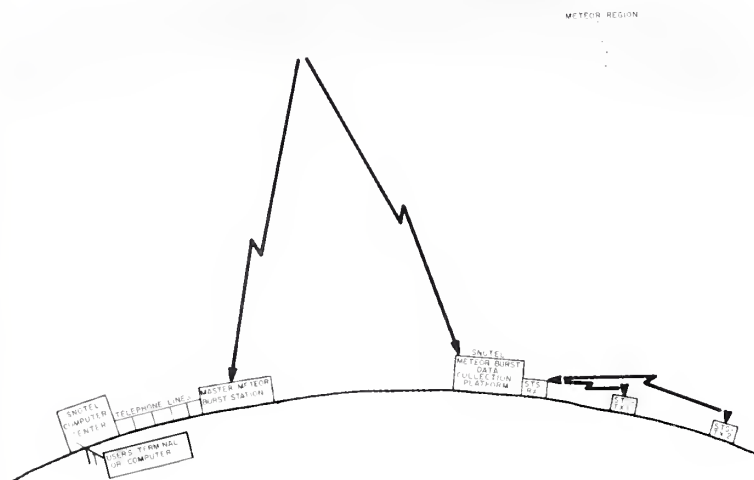
The Soil Conservation Service decided to capitalize on the glamour of its SNOTEL (snow telemetry) network to get students interested in soil and water conservation. Last year SCS signed a cooperative SNOTEL agreement with George Ek, the coordinator for the joint Conservation Education Services for the Colorado Department of Education and the Colorado Division of Wildlife.

Ek chooses the schools that will participate in the SNOTEL project. He started with a small private school, the Janus Wilmont School in the Denver, Colo., metropolitan area. Before the school year ended, he had signed up two Denver public high schools and one private outdoor education center near Colorado Springs.

Each eighth and ninth grade student at Janus Wilmont has adopted one of Colorado's 51 SNOTEL sites. They read data from the sites throughout the school year and develop reports.

The Janus Wilmont students will see what's behind a name when they visit a site at Berthoud Summit, which is 55 miles west of Denver. The trip had to be canceled last spring because there was 10 feet of snow at the site and there weren't enough snowshoes to allow all the students to walk the 150 yards from the highway to the site.

Ek says winter is the most exciting time to visit a SNOTEL site and some students will visit more remote sites on cross-country skis. Ek sees this project as a precedent for using software developed by the U.S. Department of Interior's Fish and Wildlife Service and accessing the computer files of the Colorado Division of Wildlife. Ek, in fact, sees students combining SNOTEL data with wildlife information to determine the prospects for wildlife in a particular watershed.



Bernie Shafer, former SCS snow survey supervisor in Colorado and now data analysis group leader for the SCS water supply forecasting staff in Portland, Oreg., proposed the SNOTEL project to Ek. Ek got a favorable response when he mentioned the idea to others, so he and Shafer organized the program.

When Shafer transferred to Oregon, Garry Schaefer assumed responsibility for the project, as the new SCS snow survey supervisor for Colorado. Schaefer put together a slide show to introduce SNOTEL to teachers and students.

He tells teachers that the applications of SNOTEL are limited only by their imaginations. Students learn there's more to computers than balancing check-books and playing games. They also learn math, statistics, science, weather, geography, and the history and social implications of water-related issues.

Chris Wilson, the director of the Janus Wilmont School, says water issues are relevant to students in the West because water rationing in the summer is a way of life for them.

Ek says the data students convert to graphs come alive for them because the data are drawn from real life situations and the students have vivid images of the equipment collecting the data.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*,
SCS, Washington, D.C.

SCS Looks at the Plant Materials Centers Program

A recent evaluation of the Soil Conservation Service's national Plant Materials Centers (PMC) Program compares its efforts with national soil and water conservation goals and priorities.

An SCS evaluation team began collecting data in spring 1982, although planning began the previous year. The team collected some data for the 5-year period from 1978 to 1982 and other data for fiscal year 1982 only. They sent a questionnaire to each of the 23 PMC's throughout the Nation and another one to SCS State plant materials specialists.

This year, SCS published a draft of a situation report that summarizes the data and shows how much time, expressed as percentages, the national PMC program spent in fiscal year 1982 developing plants for different conservation uses.

Grouping the data to coincide with the Soil and Water Resources Conservation Act's (RCA) National Conservation Program (NCP) priorities and concerns, the PMC program was directing 64.9 percent of its staff time toward NCP. However, only 10.6 percent of this staff time was spent on plant development specifically for cropland erosion control. Some internal redirection is warranted at several PMC locations to more adequately address this conservation problem because about 44 percent of the Nation's soil erosion is on cropland and NCP gives cropland soil erosion a top priority.

Wayne Everett, the SCS Evaluation and Analysis Division soil conservationist who led the evaluation team, stresses that the report shows where the national PMC program is in relation to NCP by conservation land uses. "It is up to SCS State staffs and PMC managers to look at the national data and the local data for their PMC and its service area and decide if any changes need to be made based upon local service area needs," Everett said. "If the PMC advisory committee decides that a PMC needs to spend more time on cropland erosion projects, the center will adjust by

eliminating some least promising plant testing for nonpriority uses."

Many PMC's are already looking more critically at the national and local erosion priorities and have started new cropland erosion control projects. The first listing of RCA goals in 1980 and the adoption of the NCP in December 1982 led to these changes.

The questionnaires themselves caused changes even before the results were published, as the PMC's compared their work with the needs of SCS and other agencies they serve. Changes in the national PMC program tend to be gradual because the work is long term, taking about 15 years to evaluate and release a new variety. However, there may be dramatic changes at a few PMC's, such as those in cropland erosion control target areas.

Everett says if the PMC data were collected in 1983, the results would be more in line with the NCP because of the internal redirections that many PMC's have already initiated.

The data show that, nationally, the PMC program is decreasing the amount of time spent developing plants specifically for wildlife habitat improvement and other uses and increasing the amount of time developing new plants for flood control, water conservation, and water quality. The NCP lists flood control and water conservation as the second national priority.

The data also give the PMC program personnel new tools to help SCS State staffs use PMC-released varieties. These tools include a national list of varieties used by States, a list of State planting guides for these varieties, and computer-generated maps showing the geographic range of adaptation of individual varieties, by major land resource area.

The evaluation team recommended that some of the questionnaire data be collected and automated periodically to improve program management and help future evaluations.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*,
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Snowmaker Display Shows Benefits of Conservation Practices

A Minnesota conservation district supervisor and a Soil Conservation Service soil scientist have teamed up once again to build a display to demonstrate the benefits of conservation practices. Franklin Clough, Kandiyohi County district supervisor, and Allan Giencke, SCS soil scientist, have built a "snowmaker" display, a spinoff of their successful rainmaker display. (See article in the November 1981 issue of *Soil and Water Conservation News*.)

The snowmaker display consists of two farms: one with ridge tillage, chiseling, no-till, and field and farmstead windbreaks; the other with conventional tillage and a farmstead windbreak in disrepair. On the conservation field, "snow" blows across the field collecting in the ridges and the residue. On the conventionally plowed field, snow doesn't collect but piles up in the unprotected farmstead. "The display shows how residue from conservation tillage and windbreaks collects the snow and protects the field from erosion," said Clough.

The first hurdle Clough and Giencke faced in completing the display was to locate a medium that looked like and performed like snow. Perlite looked promising until clouds of smoke were created when it was recycled through the fan. Another compound, Cabasill, "clung like fungus to the glass," recalled Giencke.

They scratched the industrial supplies and opted for household supplies—a mixture of flour, salt, and sugar. Under high humidity conditions, "the flour baked on the glass, the salt corroded the metallic parts, and the sugar melted and stuck like glue," said Giencke.

By then, 6 months had passed and Clough and Giencke were ready to scrap the project. "We knew we needed a light material for the snow," said Clough. "In my mind's eye, I imagined a scene of snow drifts around the farmstead," he said. The breakthrough came

during a brainstorming session when Giencke remembered seeing "white sand that resembled snow" in Florida. SCS District Conservationist Les Swanson, who was planning a Florida trip, returned with buckets of the "snow."

The white sand looked like snow blowing across the field, but it created another problem. The louvers and vents had been painted black. "The sand acted like a sandblaster, eroding away the black paint," said Giencke, "causing a 'snirt' condition." Removing the paint from the louvers and vents resolved that problem.

The display, constructed of plywood and a glass cover, weighs 150 pounds and is approximately 3 by 3 feet. A motor-fan system blows the snow through three ducts, which direct the snow across the field. Once the field is covered with snow, the display is tilted and the snow recycled through the system. A tape recording of gusty winds provides the sound effects to attract people to the display. Minnesota conservation districts can rent the snowmaker for a nominal fee.

Kate Brady,
former public affairs specialist, SCS, St. Paul, Minn

Living Fences Keep Snow Off the Road

The Valley County Road Department in Nebraska is saving money by using eastern redcedar trees as living snowfences along its highways. The road department along with the Lower Loup Natural Resources District (NRD) in Valley County pioneered the use of windbreaks to prevent snowdrifts from closing highways.

Howard Paulsen, now retired, was the Soil Conservation Service district conservationist in Ord, Nebr., when the program began and worked closely with the county road department and the Lower Loup NRD to organize the program. They planted four living snowfences in 1975 of 1.5 miles on 19.5 acres. To date, they have planted 26 snowfences, totaling 10.7 miles on 122.1 acres.

"We find that the trees, with normal care, begin to have effect by the third year," said Allen Dunbar, SCS soil conservation technician in Ord. "The first trees, planted in 1975, have been very effective for several years."

"The greatest visible benefits accrue to the county road department in reduced snow removal costs and less labor putting up and taking down slatted snowfence," Dunbar said. "Farmers benefit from field protection, winter livestock protection, and increased wildlife habitat. SCS and the public benefit from additional conservation on the land."

County engineers choose spots where roads are commonly closed because of snowdrifts. They ask landowners for permission to plant the windbreaks. The county pays for tree planting service and replanting for 2 years, weed control for 3 years, planting cover crops and grass between rows, and the labor and equipment needed to build fences to keep livestock out.

Nebraska has a special incentive for landowners through the State Game and Parks Commission's Wildlife Habitat Improvement Program. The Lower Loup NRD uses cost-share funds from this program and their own money to pay farmers an annual lease payment for setting aside land for living snowfences and wildlife habitat. The State Game and Parks Commission also provides all material, including fence, trees, and seeds.

Keith Ticknor, the SCS State staff forester in Nebraska, has developed State specifications for living snowfences. The row of trees nearest the road should be at least 150 feet from the centerline. There must be at least three rows of evergreens. Owners can add a fourth row of shrubs for wildlife, if they wish.

The trees, usually eastern redcedar in Nebraska, should be 4 to 6 feet apart in the rows, especially the windward row. Ticknor says, "Over the conservative estimate of a 50-year lifespan for trees, the living snowfence will save more than \$72,000 per mile. This is based on established trees versus putting up and taking down the slatted fence every year and replacing the fence every 5 years. The

eastern redcedar is a long-lived tree."

Ticknor says the Lower Loup NRD demonstrated a successful way to use the living snowfences and now it's spreading. Statewide, Nebraska has planted more than 70 living snowfences, along more than 28 miles.

Based on Nebraska's experiences, Colorado began a program last spring that has already ranked them second in the number of living snowfences planted. They planted 12, for a total length of 3 miles. They are evaluating these windbreaks and plan to install at least as many this spring. Colorado's low precipitation during the growing season makes it necessary for them to use drip irrigation to establish the trees. SCS in Colorado credits the strong support of the Colorado Soil Conservation Board and the Colorado Association of Conservation Districts for the program's success.

Colorado and Wyoming have signed memorandums of agreement with Federal and State agencies to develop living snowfence programs. Wyoming has just built three living snowfences for demonstrations this year. They planted five-row snowfences with Rocky Mountain juniper and ponderosa pine in two windbreaks and those species plus Siberian peashrub in the third windbreak.

Instead of standard slatted fences, Wyoming often uses 6- to 12-foot-high tepee-shaped wooden structures to overcome strong winds and frequent snowstorms. Five-row windbreaks are needed to be as effective as these giant structures.

Wyoming has to rely on drip irrigation for establishing its windbreaks as does Colorado. This raises the initial cost of the windbreaks, but the irrigation equipment can be removed and used elsewhere in a few years.

Wyoming SCS State Biologist Richard Rintamaki says the Wyoming Highway Department estimates the living snowfences will save \$176,000 per mile over a 50-year period because of the expense of the giant wooden fences.

Rintamaki says there is still work being done to test the suitability of various tree

species for living snowfences.

Colorado inspired South Dakota to take another look at the few living snowfences it built in the sixties. South Dakota is gathering cost comparison data now as preparation for a living snowfence program, with the support of the South Dakota Association of Conservation Districts.

A Nebraska State forester who transferred to North Dakota spurred that State to begin planning living snowfence tests. They will test high-density, two-row windbreaks.

With the help of local districts, more and more counties are using living snowfences to keep snow off the roads.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*,
SCS, Washington, D.C.

USDA's Forest Service Promotes Trees for Snow Control

USDA's Forest Service is promoting living snowfences in the second year of a 3-year snow management technology transfer program it is sponsoring in Colorado and Wyoming. The program is supported by landowners, private industry, and government agencies.

Dr. Dale Shaw, director of technology transfer for the Forest Service at Fort Collins, Colo., began focusing on living snowfences after visiting Dick Beran, the manager of the Lower Loup Natural Resources District at Ord, Nebr. Now the efforts in Colorado and Wyoming are generating interest in other States, such as Montana, Kansas, and North and South Dakota.

Shaw has sent these States information packets that include a flyer illustrated with color photographs of living snowfences near Ord. A large photograph on the front of the flyer shows Beran looking at his district's first living snowfence, planted in 1975.

On the other side of the flyer, there are three smaller photographs, including one of Howard Paulsen, former Soil Con-

servation Service district conservationist at Ord, showing the height of a snowfence tree.

For up to five copies of the flyer titled "The Living Snowfence: A New Look at an Old Problem," write to Dr. Dale Shaw, Director, Technology Transfer, Rocky Mountain Forest and Range Experiment Station, Room 117, 240 West Prospect Street, Fort Collins, Colo. 80526. For more than five copies, the cost is 30 cents each.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*,
SCS, Washington, D.C.

Living Snowfence Tested Under Harsh Conditions

Scientists at USDA's Forest Service Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo., recently conducted a study along Interstate 80 in southern Wyoming (with some of the most severe blowing snow conditions in the country) to determine the ability of several tree and shrub species to establish and grow in this type of environment.

A report about this research is available and discusses the species used in the shelterbelt planting (Colorado blue spruce, ponderosa pine, white fir, Russian olive, Siberian elm, Siberian peashrub, basin big sagebrush, oldman wormwood, and white rabbitbrush) and their survival and growth characteristics during the first 5 years after planting.

For details on this research, request a copy of *Shelterbelt Establishment and Growth at a Windswept Wyoming Rangeland Site* (Research Paper RM-243) from the Rocky Mountain Forest and Range Experiment Station, 240 West Prospect Street, Fort Collins, Colo. 80526.

Reprinted from the June 1983 issue of *Forestry Research West*.

CONSERVATION Research Roundup

Seven Guayule Varieties Tested, Released

The agricultural experiment stations in New Mexico, Arizona, California, and Texas and the U.S. Department of Agriculture have released seven varieties of guayule, a small desert shrub containing rubber.

Varieties N-565, 11604, 11619, 11591, 11605, 12229, and N-576 were tested in Arizona at Tucson and Mesa and in New Mexico at Las Cruces. Rubber yield and rubber percentage data were taken on 2- and 3-year-old plants.

The varieties are part of 25 germ plasm lines and selections that were stored at the National Seed Storage Laboratory at Fort Collins, Colo., in 1965 after a USDA guayule breeding program at Salinas, Calif., was closed.

Researchers chose strains from storage on the basis of cold tolerance, plant uniformity, rubber yield, rubber percentage, growth characteristics, seed production, stand establishment, and availability of seed.

Overall, variety 11605 averaged the most rubber per acre, about 1,000 pounds, during the second year of testing. Variety N-565 produced the most rubber per acre, almost 1,400 pounds, during the third year. Average percentage rubber content on a dryweight basis was 5.8 percent for variety 11604 and 7.3 percent for variety N-565.

Researchers say it is important to continue to develop guayule as an alternate rubber source to offset a crisis that could occur if current sources were not available.

Presently the United States imports all natural rubber, about 1 million tons, at a cost of nearly one-half billion dollars. Most rubber comes from Malaysia. Guayule rubber is essentially identical to rubber from Asian trees and can be used for such items as tires or medical supplies.

Researchers say an improved guayule shrub with high rubber content and an extended climatic range could play a significant role in the world's rubber supply.

Getting the Message From Thirsty Plants

If soybean plants could talk, one of the main things farmers would ask them is "Are you thirsty?" Agricultural scientists are not teaching plants to talk, but they are developing more and more sophisticated methods for determining when they are thirsty and just how thirsty they may be.

Irrigation has become a common practice in soybean production in Arkansas. Timing of irrigation is important for maximum yields and efficient use of water, according to Don Scott, University of Arkansas (UA) agronomist.

The currently recommended method of timing irrigation is to monitor soil moisture with tensiometers, and irrigate to maintain soil moisture within a certain range of tensiometer readings.

Scott and his colleagues at the UA Agricultural Experiment Station are conducting research on using "plant measurements" rather than soil measurements for irrigation timing.

A method under investigation by Mark Wenzelburger, a graduate student, and Scott is the use of infrared thermometry to monitor the degree of water stress in growing plants.

A healthy plant maintains a temperature lower than the surrounding air by transpiration of water through its foliage. When the plant has an inadequate supply of water, its temperature increases and it soon becomes warmer than the surrounding air, Wenzelburger explained.

The infrared thermometer, a product of computer technology, measures infrared radiation given off by plants and converts the measurements to temperature readings. The instrument is held by hand and readings are obtained by simply pointing it at a field of soybeans.

Infrared thermometry is already used in Western States where the skies are not cloudy all day and temperature and humidity are a constant hot and dry throughout the growing season. In Arkansas, conditions affecting the plant's cooling system are less predictable. "We

are trying to refine the technology so it will work in our part of the country," Scott said.

Wenzelburger has conducted 2 years of field tests at Fayetteville, Ark., comparing the infrared thermometer and the tensiometer. His best yield using the infrared instrument was 47 bushels per acre, compared to 52 bushels using the tensiometer. "We used a lot less water (in the infrared plots), but our main objective is to maximize yields," he said.

Scott has more field testing planned using different combinations of infrared thermometry readings to refine the technique. "We need another year or two of data," he said. "I'm not yet ready to say this is the way to go, but I think we are close."

No-Till Research Out to Save Farmers Money

Producing more no-till corn for less money is the goal of two research projects underway at the University of Kentucky's (UK) Robinson Substation at Quicksand.

The research may save no-till corn producers money by improving the efficiency of nitrogen fertilizer and by increasing the effectiveness of herbicides in no-till corn.

Ken Wells, Extension soils specialist in the UK College of Agriculture, is looking into improving nitrogen's efficiency in no-till corn.

"We are trying to find the method of applying nitrogen fertilizer in no-till corn that produces the best yields," said Wells.

He is comparing nitrogen surface broadcasted at planting with nitrogen applied under the soil in bands at planting. He is also looking at nitrogen applied to the surface 7 weeks after planting.

Two nitrogen fertilizers are being used, ammonium nitrate and urea, in tests begun in 1982 and continued in 1983.

"Our 1982 results showed that corn yields responded very well to nitrogen fertilizer at planting, especially when the

nitrogen was applied beneath the surface," said Wells. "Yields from surface applications 7 weeks after planting also were good."

Ammonium nitrate produced better results than urea, he added.

"We feel that our results can be important to farmers in the eastern part of the State, where no-till production is needed because of the soil erosion hazard," said Wells.

John Grove, a soil fertility researcher in the UK College of Agriculture, also is working on a research project involving nitrogen fertilizer's use in no-till. But rather than looking at nitrogen's effect on yields, Grove is looking at nitrogen's effect on the efficiency of herbicides used in no-till weed control.

"You get a strong acid layer at the soil surface in continuous no-till corn production. The acidity develops from surface applications of nitrogen," Grove said.

This acid layer at the surface has adverse effects on many of the herbicides used to control weeds in no-till corn.

"These herbicides are important and they aren't cheap, so the producer needs to get results from the first application," said Grove.

Grove is looking at the effect a superfine, fluidized lime solution has on the acid layer.

"We want to see if such a solution will cut down on the amount of lime needed to control this acidity or if it will make the lime react faster," said Grove.

Some of the treatments Grove is using control the acid already in the soil and some treatments add a little lime every year with the nitrogen solution to see if that will control any acid created by the nitrogen fertilizer.

Although 1983 was the first year of the experiment, the research may result in a real savings to no-till corn producers.

Scientists Study Ways to Help Small Farmers

Amid the acres of experimental vegetables at the Horticultural Crops Research Station near Raleigh, N.C., is a plot that looks like a big garden.

Within its 2-acre boundaries more than 20 different vegetables will grow before the year is out, and at least some of these vegetables will be ready for harvest about all the time.

The big garden is actually a research plot for small farmers. Two researchers from North Carolina State University (NCSU) are using the plot to see how a family might earn the most income from a small tract of land.

"We're looking at crop mixes, yields, labor requirements, and crop-pest interactions," said Douglas Sanders, a horticulturist. "We're also looking at dollar returns," said Edmund Estes, an economist.

Eventually the two researchers would like to write a computer program based on their work. The program would be made available to county extension agents. Then small farmers could go to their extension office and say, "I've got this much land and this much labor. What can I grow to make the most money?"

An objective of the research is to develop a sequence of crops to spread out labor needs and take advantage of North Carolina's relatively long growing season. For example, a portion of the land might be used for growing green onions from October to April, tomatoes from April to July, and broccoli from August to October. Another sequence might be squash, eggplants, and collards.

"We'd like to have something to sell at least 10 months of the year," Sanders said. Estes believes a long selling season might help a farmer in lining up a marketing outlet. For his research, Estes used vegetable prices at the auction market in Faison.

Now in its second year, the research is financed by a grant from the U.S. Department of Agriculture to NCSU's Agricul-

tural Research Service. The project has about another year to go, after which Estes and Sanders hope to generate hard numbers on what a small farmer can expect.

In the meantime, the two researchers are picking up ideas on cultural practices that might be suitable for such a high-intensity operation.

For one thing, half the vegetables are grown on black plastic and half on bare soil. "Plastic is a revolution," said Sanders. "It permits earlier, better, more uniform growth, and it conserves water and nutrients."

For example, Sanders and Estes are able to get okra a month earlier than under traditional field conditions. They grow the seedlings in peat pots and set them in plastic-covered soil.

The researchers have also concluded that North Carolina farmers are "land extravagant." Normal row widths of 3 to 3½ feet were established to accommodate mules and horses. Sanders and Estes find they can increase production by planting double rows of many crops on 5-foot centers. With crops like greens, carrots, onions, and spinach, they can go to four-row beds.

A more complex portion of their research deals with crop-pest interactions. Normally pests are not as big a problem in small plantings as in huge monocultures. But some crops can attract pests that attack other crops and crops that follow. Also some crops may be better than others in using residual nutrients.

"Finally, we are learning about the importance of timing," Sanders said. "If one crop is late, like many of them were this year, we mess up our entire cropping sequence."

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Meetings	January	8-12	American Farm Bureau Federation, Orlando, Fla.
		22-26	North American Gamebird Association, Daytona Beach, Fla.
		25-27	National Cattlemen's Association, New Orleans, La.
	February	5-9	National Association of Conservation Districts, Denver, Colo.
		12-14	The Fertilizer Institute, New Orleans, La.
		13-17	Society for Range Management, Rapid City, S. Dak.
		15-18	Land Improvement Contractors of America, New Orleans, La.
	March	4-9	Association of Interpretive Naturalists, Pine Mountain, Ga.
		11-16	American Society of Photogrammetry and the American Congress on Surveying and Mapping, Washington, D.C.
		15-18	National Wildlife Federation, Atlanta, Ga.
		23-28	North American Wildlife and Natural Resources Conference, Boston, Mass.
	April	1-3	American Pulpwood Association, Atlanta, Ga.
		22-25	Association of American Geographers, Washington, D.C.
	May	5-9	American Planning Association, Minneapolis, Minn.
		6-9	National Forest Products Association, Washington, D.C.
		13-16	National Council of State Garden Clubs, Albuquerque, N. Mex.
		13-17	League of Women Voters of the United States, Detroit, Mich.
		14-18	American Geophysical Union, Cincinnati, Ohio
		16-18	Hardwood Plywood Manufacturers Association, Ottawa, Ontario, Canada
		16-18	Southern Forestry Conference, Nashville, Tenn.
		23-25	Boy Scouts of America, Salt Lake City, Utah
	June	30-June 1	International Congress on Irrigation and Drainage, Fort Collins, Colo.
		10-15	General Federation of Women's Clubs, Las Vegas, Nev.
		22-28	National Environmental Health Association, Grand Rapids, Mich.
		24-27	American Society of Agricultural Engineers, Knoxville, Tenn.
		24-28	American Seed Trade Association, Denver, Colo.
		24-28	Forest Products Research Society, St. Louis, Mo.